Please replace the paragraph beginning at page 1, line 2, with the following rewritten paragraph:

A2

--The present invention relates to an energy dispersion type fluorescent X-ray type thickness measurement device having the merits of being both multi-elemental and non-destructive and being for use in film thickness management in the surface processing industry such as the plating and sputtering of films.--

Please insert the following heading on page 1, between lines 7 and 8 after the title:

A3

--Background Information--

Please replace the paragraph beginning at page 2, line 1, with the following rewritten paragraph:

A4

--Fig. 5 shows an example of a related art fluorescent X-ray film thickness measuring device. A high voltage is applied from an X-ray generation high voltage source 1. Primary X-ray 3 emitted from an X-ray tube 2 are then irradiated onto a sample 5 by means 4 for focusing onto a microscopic unit using a slit, collimator, or capillary utilizing a total reflection phenomena. A sample observation mirror 6 and a sample observation optical system 7 are provided for positioning of the measurement locations by movement of the sample 5 through control of a stage 19 by a

A4 Concl'd

control and computing section 17. Fluorescent X-rays 8 generated by the sample are detected by an energy dispersion-type sensor 9. A pre-amplifier 10 is provided to receive an output of the sensor 9. A pre-amplifier 10 is provided to receive an output of the sensor 9 and a linear amplifier 11 receives the output of the pre-amplifier, which is supplied to a frequency analyzer (MCA) 12 with an output signal thereof being quantitatively processed by a control and computing section 17.--

Please replace the paragraph beginning at page 3, line 9, with the following rewritten paragraph:

A5

--Conventionally, a proportional counter tube is typically employed when carrying out film thickness measurements on thin films using a fluorescent X-ray film thickness measurement device. Accurate film thickness and composition measurements are possible without performing special processing provided that the atomic numbers of the elements making up the thin film and materials (substrate) are separable to a certain extent when using a proportional counter tube. However, when the atomic numbers are separated into the neighboring nickel (Z=28) and zinc (Z=29), there is a problem that the peaks to be counted overlap with each other, which needs to be remedied. For example, there is a secondary filtering method whereby a thin plate of cobalt (Z=27) is

A5 conc'd

inserted prior to detection and peak separation is achieved by utilizing the difference in results for absorption of copper, and a digital filtering method which provides a peak separation by performing numerical operation on the shapes of the peaks. The secondary filtering is limited to appropriate combinations. This is therefore effective in the case of dedicated function but is not appropriate in cases where the object is to take measurements for various combinations. The digital filtering method is capable of being applied to various combinations but there are problems with stability compared with secondary filtering methods that accompany peak separation errors.--

Please replace the paragraph beginning at page 6, line 12, with the following rewritten paragraph:

A6

--According to the present invention, counting is performed simultaneously using a two system X-ray detector by dividing the energy regions in such manner that a PIN diode detector of superior energy resolution is utilized for low energy regions where X-ray energies are close to each other and a proportional counter tube or CdZnTe detector with a superior count rate but with poor resolution for high energy regions is utilized when the count rate is poor using the PIN diode detector high resolution is not required.--

Please replace the heading at page 8, line 3, with the following heading:

A7

--DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS--

Please replace the paragraph beginning at page 8, line 12, with the following rewritten paragraph:

A8

At the time of irradiation, since measurement regions are microscopic, a sample observation mirror 6 and a sample observation optical system 7 are provided for positioning of the measurement locations by movement of the sample 5 through control of a stage 19 by a control and computing section 17. Fluorescent X-rays 8 generated by the sample are positioned in such a manner as to be detected by an energy dispersion-type first sensor 9 and a second sensor 13. A sensor 13 characterized by high resolution, for example a PIN diode detector or a high resolution X-ray detector such as a silicon drift chamber, is provided at an energy dispersion-type X-ray detector. When a PIN diode detector is utilized in the sensor 13, resolution (FWHM) with respect to the Mn-Ka line (5.9keV) is in the order of 200eV, and the count rate is in the order of a few tens of thousands cps. However, this is used as a low energy detector due to the detection rate for high energy X-rays being poor. When a proportional counter tube is used as the sensor 9, the resolution is in the order